

Photoionized Herbig-Haro objects in the Orion Nebula through deep high-spectral resolution spectroscopy II: HH 204

J. E. MÉNDEZ-DELGADO,^{1,2} C. ESTEBAN,^{1,2} J. GARCÍA-ROJAS,^{1,2} W. J. HENNEY,³ A. MESA-DELGADO,⁴ AND K. Z. ARELLANO-CÓRDOVA⁵

¹ Instituto de Astrofísica de Canarias (IAC), E-38205 La Laguna, Spain

² Departamento de Astrofísica, Universidad de La Laguna, E-38206 La Laguna, Spain

³ Instituto de Radioastronomía y Astrofísica, Universidad Nacional Autónoma de México, Apartado Postal 3-72, 58090 Morelia, Michoacán, Mexico

⁴ Calle Camino Real 64, Icod el Alto, Los Realejos, 38414, Tenerife, Spain

⁵ The University of Texas at Austin, 2515 Speedway Boulevard Stop C1400, Austin, TX 78712, USA

(Received XXX; Revised YYY; Accepted ZZZ)

Submitted to ApJ

ABSTRACT

Contribuciones de Will para el artículo

Keywords: ISM:Abundances – ISM: Herbig–Haro objects – ISM: individual: Orion Nebula – ISM: individual: HH 204

1. MATERIAL DE WILL

1.1. Sub-arcsecond imaging of HH 204

Figure 2 shows the ratio of surface brightnesses [O III] $\lambda 5007/\text{H}\alpha \lambda 6563$ calculated from *HST* WFC2 observations in the F502N, F547M, F656N, and F658N filters from program GO5469 (O’Dell & Wong 1996).

Flux calibration and correction for contamination by continuum and non-target lines was performed using the coefficients given in O’Dell (2009). It can be seen that the line ratio in the background nebula shows a pronounced gradient from $\lambda 5007/\text{H}\alpha \approx 0.3$ in the north-east to $\lambda 5007/\text{H}\alpha \approx 0.5$ in the south-west.¹ Inside the bow shock, the ratio is significantly smaller, for instance falling from $\simeq 0.4$ to $\simeq 0.2$ along the length of the slit.

REFERENCES

O’Dell, C. R. 2009, PASP, 121, 428

O’Dell, C. R., & Wong, K. 1996, AJ, 111, 846

Weilbacher, P. M., Monreal-Ibero, A., Kollatschny, W., et al. 2015, A&A, 582, A114

Corresponding author: José E. Méndez-Delgado
jemd@iac.es

¹ For comparison with results from our UVES spectra, and using the average reddening for the HH 204 region (Weilbacher et al. 2015), the conversion is $\lambda 4959/\text{H}\beta \approx 1.1\lambda 5007/\text{H}\alpha$.

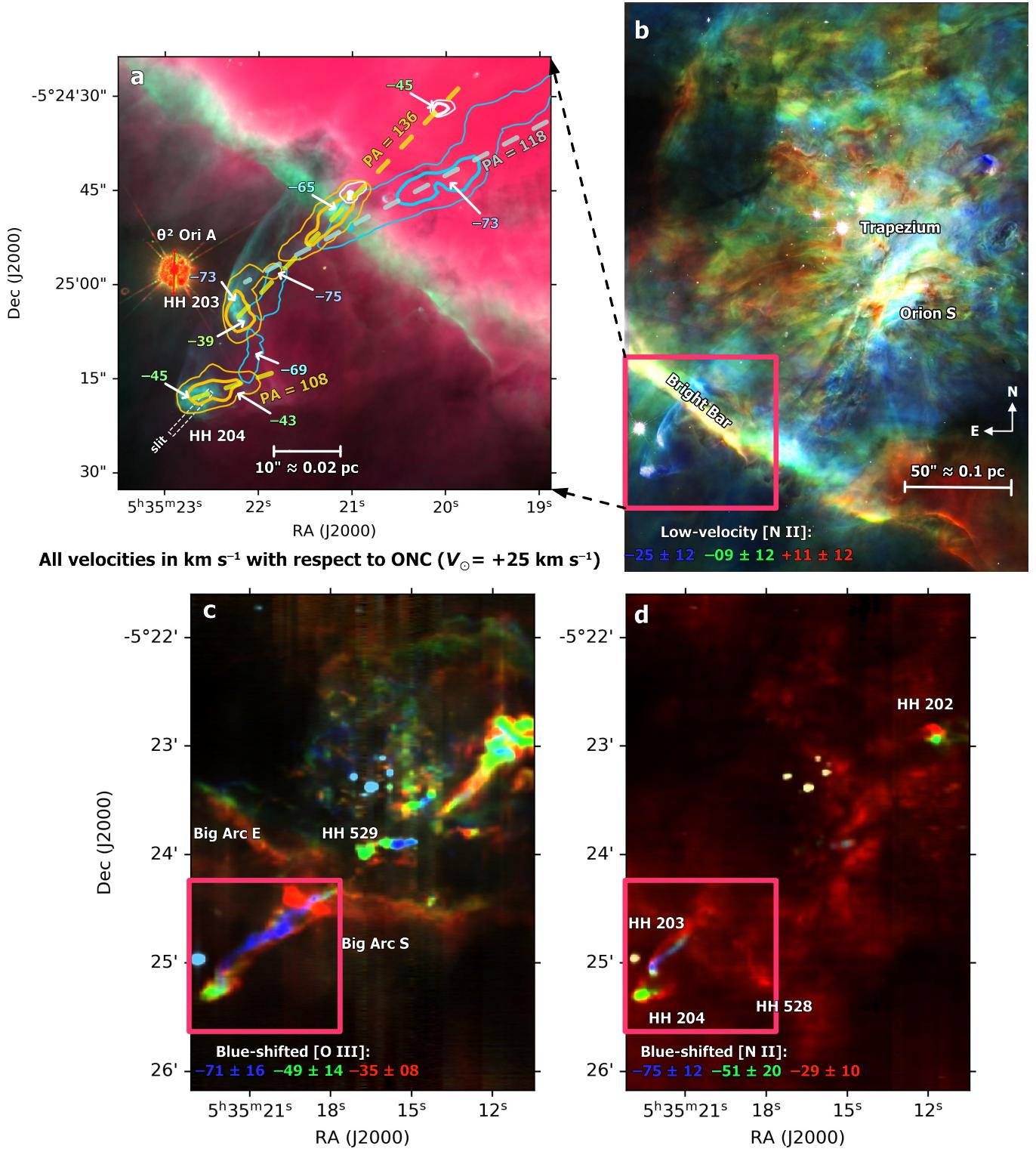


Figure 1. Finding chart.

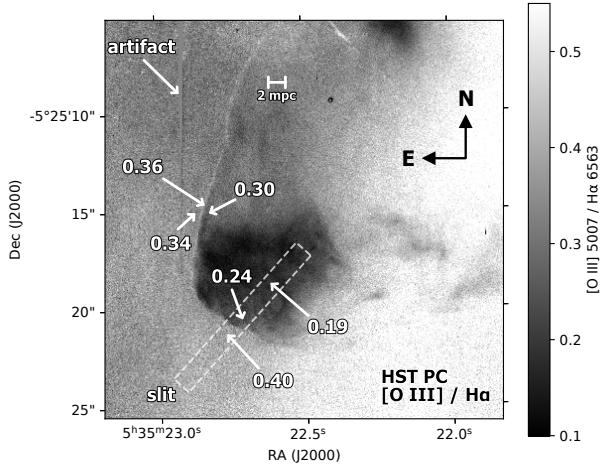


Figure 2. Map of the line ratio $[\text{O III}] \lambda 5007 / \text{H}\alpha \lambda 6563$, calculated from *HST* images with the PC chip of the WFPC2 camera. Particular values of interest are indicated by arrows. The position of the UVES spectrograph slit is outlined by dashed lines. The vertically oriented “scar” at upper left is an artifact due to the bright star θ^2 Ori A, located just north of the field of view.